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EXAMINER

SINGH, RAMNANDAN P

ART UNIT PAPER NUMBER

2644

DATE MAILED: 03/12/2004

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/027,158

Applicant(s)

TAHERNEZHAADI, MANSOUR

Examiner

Ramnandan Singh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 06 January 2004 have been fully considered but they are not persuasive.

(i) Applicant's argument—"Moreover, because Laberteaux teaches use of ERLE alone, and teaches no other structure or functionality for detecting transitions between linear and non-linear echo path, Laberteaux fails to teach or suggest the present invention" on page 10.

Examiner's response—The Examiner respectfully disagrees. Laberteaux teaches an adaptive echo canceller architecture for detecting a double-talk state using multiple criteria based on (i) ERLE and (ii) when both the speaker at the far-end and the speaker at the near-end are speaking concurrently [col. 2, lines 53-67; col. 5, lines 38-44; col. 5, line 45 to col. 7, line 10; col. 7, lines 18-45]. In addition, Laberteaux discloses considering the presence of a D.C non-linearity in an echo path [col. 7, lines 46-50].

(ii) Applicant's argument—" Claim 2 sets forth that the determination of transitions between linear and non-linear echo path relies on performing at least one of plurality of tests. As described above, Laberteaux solely teaches evaluation of ERLE to determine linear to non-linear echo path transition, and thus fails to teach a plurality of tests " on page 11.

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Examiner's response— In response to the first part of the Applicant's argument, the examiner points out that claim 2 sets forth a requirement to perform at least one of plurality of tests. Specifically, claim 2 does NOT require performing all the plurality of tests. In view of this, the Applicant's argument is INVALID. With respect to the second part of the Applicant's argument, the Examiner asserts that Laberteaux does perform multiple tests [See Figs. 3-4, 6, 9; col. 5, line 45 to col. 7, line 50; col. 7, lines 51 to col. 10, line 62].

(iii) Applicant's argument—"Claim 3 specifically defines a plurality of tests that may be relied upon to determine linear to non-linear echo path transition, which tests are not taught by Laberteaux" on page 11.

Examiner's response—The Examiner respectfully disagrees. Claim 3 recites the limitation "wherein a test of the plurality of tests comprises one of the group of tests comprising:" on page 3. Laberteaux teaches one of the group of tests comprising: "checking for echo canceller divergence" during a doubletalk condition [col. 5, line 38 to col. 6, line 34; col. 7, lines 51-65; col. 4, lines 21-34; col. 8, lines 32-46; col. 10, lines 21-37]. In addition, ERLE defines an energy measurement for evaluating attenuation of the echo.

(iv) Applicant's argument—"ERLE values correspond to use of the first and second tap filter coefficients, to detect linear to non-linear echo path transition. This is not a plurality of tests" on page 11.

Examiner's response—The Examiner respectfully disagrees. Claim 3 does NOT claim performing all of the plurality of tests as set forth therein, rather "one of the group of tests". As shown above, Laberteaux teaches performing one of the group of tests based on two ERLE parameter values with multiple criteria [col. 4, line 56 to col. 5, line 9]. Fig. 3 illustrates one manner of implementing these two parameters [col. 5, line 10 to col. 7, line 50].

2. **Status of Claims**

Claims 1, 16 are amended.

Claims 1-20 are pending.

Drawings

3. With the Applicant's argument, the objection to the drawings is withdrawn.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-10, 12-13, 16-18, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Laberteaux [US 6,028,929].

Regarding Claim 1, Laberteaux teaches a method for controlling an echo canceling system 25 shown in Fig. 2, the method comprising the steps of:

detecting an occurrence of a non-linear echo path when the time dispersion value moves above a time dispersion threshold, otherwise the echo path is assumed to be linear. Thus, an experimentally chosen time dispersion value of this threshold provides a transitional indication from non-linear echo path to linear echo path and vice-versa [col. 3, lines 1-40; Fig. 6; col. 10, lines 1-10; col. 7, line 58 to col. 8, line 56];

distinguishing (i.e. **detecting**) a double-talk condition when the speaker at the near-end and the speaker at the far-end are speaking concurrently [col. 2, lines 53-67; col. 4, lines 20-34; col. 4, lines 46-56];

halting (i.e. **inhibiting**) a standard adaptation routine (i.e. **transfers of filter coefficients**) during the double-talk condition [col. 5, lines 38-44]; and

initiating a prescribed logic routine [See Figs. 3, 4, 6] to control the echo canceling system in the presence of a D.C. non-linearity [Figs. 3-4; col. 5, line 10 to col. 8, line 31].

Claim 16 is essentially similar to Claim 1 and is rejected for the reasons stated above apropos of Claim 1.

claim 2 sets forth a requirement to perform at least one of plurality of tests. Specifically, claim 2 does NOT require performing all the plurality of tests. In view of this, the Applicant's argument is INVALID. With respect to the second part of the Applicant's argument, the Examiner asserts that Laberteaux does perform multiple tests [See Figs. 3-4, 6, 9; col. 5, line 45 to col. 7, line 50; col. 7, lines 51 to col. 10, line 62].

Claim 17 is essentially similar to Claim 2 and is rejected for the reasons stated above apropos of Claim 2.

Claim 3 recites the limitation "wherein a test of the plurality of tests comprises one of the group of tests comprising:" on page 3. Laberteaux teaches one of the group of tests comprising: "checking for echo canceller divergence" during a doubletalk condition [col. 5, line 38 to col. 6, line 34; col. 7, lines 51-65; col. 4, lines 21-34; col. 8, lines 32-46; col. 10, lines 21-37]. In addition, ERLE defines an energy measurement for evaluating attenuation of the echo.

Claim 18 is essentially similar to Claim 3 and is rejected for the reasons stated above apropos of Claim 3.

Claims 4, 5 and 10 are essentially similar to Claim 3, and are rejected for the reasons stated above.

Regarding Claim 8, see Fig. 6.

Regarding Claim 9, when a non-linear echo path is detected, the echo canceller 25 enters a time-varying mode (i.e. transient mode) [col. 9, lines 21-35; col. 10, lines 40-45] and employs a predetermined value of the counts of a counter to reset the system [col. 8, line 32 to col. 9, line 8].

Regarding Claim 12, Laberteaux discloses applying the coefficient time dispersion characteristic of the adaptive filter using the output and input of the adaptive filter shown in Fig. 5, for detecting a linear or non-linear echo path [Fig. 5; Abstract].

Regarding Claim 13, Laberteaux teaches employing an error energy for determining the quality of echo cancellation [col. 5, lines 24-37; col. 6, lines 35-50; col. 8, lines 32-46].

Regarding Claim 20, the adaptive filter 35 generates a synthetic echo.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laberteaux as applied to claims 1, 3 above, and further in view of Caceres et al [US 6,167,133] and further, in view of Romesburg [US 6,185,300 B1].

Regarding Claims 6 and 7, Laberteaux does not teach expressly checking a presence of weak echo and that of a strong echo in a communication system.

Caceres et al teaches detecting strong and weak echo in a communication system [Figs. 10-15; col. 2, line 52 to col. 3, line 12; col. 3, lines 56-67; col. 11, lines 43-50; col. 12, lines 3-27].

Romesburg teaches determining a status of an echo canceller including a level of system convergence based on a ratio of a peak update coefficient value and a baseline update coefficient value, wherein the baseline update coefficient value serves as a normalizing factor [Fig. 4; col. 2, lines 32-39; col. 11, lines 37-54; col. 12, lines 46-59]. Further, the maximum and minimum thresholds are determined [col. 14, lines 26-39; col. 15, line 19 to col. 16, line 9].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the detection techniques for weak and strong echoes of Caceres et al with Laberteaux so as to detect and track echo during a call more accurately [Caceres et al; col. 1, lines 6-10]; and the echo cancellation status indicator

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of Romesburg with Laberteaux to provide an effective echo cancellation in a bi-directional communication system [Romesburg; col. 1, lines 12-15].

8. Claims 11, 14, 15, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laberteaux as applied to claims 1, 3, 10, 16 above, and further in view of Romesburg [US 6,507,653 B1].

Regarding Claim 11, Laberteaux does not teach expressly applying an NPL having a center clipper counter value. However, the NPL is well-known in the art for suppressing residual echoes.

Romesburg teaches applying NPL 146 with a center clipper counter value [Fig. 5; col. 10, lines 29-54].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the NPL of Romesburg with Laberteaux so as to minimize clipping and distortion of desired voice signals and provide satisfactory echo suppression [Romesburg; col. 1, lines 12-15].

Claims 14 and 15 are also rejected for the reasons stated above.

Regarding Claim 19, Romesburg teaches a comfort noise generator 149 to provide a comfort noise signal to replace the clipped echo with noise samples such that the noise fill matches the noise present in the communication channels [Fig. 5; col. 13, lines 25-35].

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Wu [US 6,125,179] teaches an echo control device with quick response to sudden echo-path change [col. 1, lines 34-48; col. 4, lines 30-52].

10. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

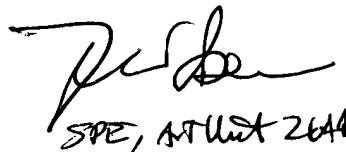
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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ramnandan Singh
Examiner
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